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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/543,121	07/22/2005	Gilbert Bouquet	62723A	4365

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The Dow Chemical Company
Intellectual Property Section
P.O. Box 1967
Midland, MI 48641-1967

EXAMINER

ASINOVSKY, OLGA

ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/543,121

Applicant(s)

BOUQUET ET AL.

Examiner

Olga Asinovsky

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-13 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Priddy et al U.S. Patent 5,721,320 in view of EP 0892 820.

3. References have been considered in the previous office action mailed on 08/08/2007.

Priddy discloses a process for producing ABS copolymer by polymerizing a vinyl aromatic monomer in the presence of a diene, rubbery using a stable free radical compound by emulsion polymerization process in the presence of solvent, column 5, lines 59-67; column 6, lines 1-60 and column 7, lines 24-44. The stable free radical reacts with the diene monomer or rubber and the polymer chain contains a stable free radical group, column 2, lines 37-40 and column 6, lines 32 and 47-53, for the present claims 1, 6-9. The polybutadiene has pendant nitroxy functional groups, for the present claims 7-8. The functionalizing diene rubber is readable in Priddy invention, column 7, lines 57-65. The stable free radical such as 2,2,6,6-tetramethyl-1-piperidenyl-1-oxy (TEMPO), column 6, lines 24-25 and column 8, lines 23 and 40, is readable in the present claim 8. The rubber is functionalized before introducing polymerized styrene and/or acrylonitrile for the present claim 1. A nitroxy terminated polyisoprene is able to control radical polymerization, for the present claim 1. The chain transfer agent can be present, column 7, lines 53-56, for the present claims 11 and 13. Initiators such as free radical initiators are present, column 7, lines 1-23, for the present claims 12-13. A

solvent is used in the process to improve the processability and heat transfer during polymerization, column 7, lines 24-42. Styrene monomer and/or acrylonitrile are polymerizing in the presence of a nitroxyl terminated polybutadiene, column 8, lines 41-43. Styrene monomer and acrylonitrile are grafted onto the rubber particles. Styrene and/or acrylonitrile form a matrix phase, column 7, lines 57-61. The grafted polymer has a Mw in the range of 15 000 to 150000, column 8, lines 1-14. The average rubber particles size is less than 0.1 micron=100 nm. In the working example 1 at column 10, the polybutadiene has Mw of 3,930. The resulting product is transparent impact polystyrene, column 10, line 40. The resulting product can be used in a variety of applications, column 8, lines 10-17, for the present claim 19.

Priddy does not disclose the claimed solution viscosity of from 5 to less than 50 centipoise in the present claim 1. Priddy does not mention the claimed solution viscosity of from 5 to less than 50 cps in the present claim 1. However, Priddy does disclose a solution polymerization of butadiene and terminating with a nitroxide containing compound, column 10, line 8. The average rubber particles size is less than 0.1 micron=100 nm. (The small particle size of the dispersed rubber in the polymer matrix is a benefit to impart gloss property of the resulting product, that is discussed in EP 0 892 820 below).

EP'820 discloses rubber-modified polystyrene. EP'820 discloses a mass/solution polymerization polybutadiene in the presence of solvent. The process can be used to

produce monomodal composition, page 4, line 52. In monomodal composition the volume average particle size are from 0.05 to 10 micrometers, page 4, line 55. Thus, EP'820 does disclose a broad monomodal size distribution for the present claim 1, page 5, lines 1-17. For products which require high gloss properties, the amount of small particles is from 85 to 98%, page 5, line 15. The size of the rubber particles are depending upon the desired gloss and impact properties of the polymer product, page 5, lines 40-41. The resulting product is useful in a wide variety of applications, page 5, lines 50-56.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a process for producing a functionalized rubber having particle size of 100 nm and grafting said rubber particles with vinyl aromatic monomer in Priddy invention wherein the small particles of rubber is a benefit to impart high gloss properties as evidence in EP'820; and since reference discloses the analogous process condition, a bulk/solution polymerization, a small rubber particles that impart high gloss property of the obtained product and a broad range of molecular weight of the functionalized polybutadiene, the claimed solution viscosity is expected to provide adequate results, whether or not these property is shown or suggested in the prior art. *In re Spada*, 911 F, 2d 705, 709 15 USPQ 1655, 1658 (Fed.Cir. 1990).

Response to Arguments

4. Applicant's arguments filed November 05, 2007 have been fully considered but they are not persuasive. Argument is that Priddy discloses a bulk (mass) polymerization process comprising a rubber carrying a functionalized group enabling controlled

polymerization with a vinyl aromatic monomer; whereas applicants' invention is a mass/solution polymerization process comprising polymerizing a vinyl aromatic monomer in the presence of a functionalized diene rubber having a solution viscosity of from 5 to less than 50 cps, (page 4).

Priddy does disclose a solution polymerization of butadiene and terminating said polybutadiene with a nitroxide containing compound, column 10, line 8. Priddy does not mention a solution viscosity within the claimed range of 5 to less than 50 cps, however, Priddy does not exclude a low solution viscosity of the functionalized polybutadiene. Applicants' argument is that the specified solution viscosity of from 5 to less than 50 cps is a benefit for obtaining the superior higher gloss property of the product, page 6 in the remarks. Priddy discloses rubber particles having a volume average particle size of less than 100 nanometer. The small rubber particles of less than 100 nm in Priddy invention are a benefit to impart high gloss properties for products that is evidence in the secondary reference to EP'820. The claimed solution viscosity is expected to provide adequate results, whether or not this property is shown or suggested in the prior art. *In re Spada*, 911 F. 2d 705, 709 15 USPQ 1655, 1658 (Fed.Cir. 1990). The preferred embodiments of the Mw of the rubber do not constitute a teaching away from non preferred embodiments in the disclosure in Priddy invention. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971).

Applicants Affidavit under 37 CFR 1.132 filed on 11/05, 2007 has been considered.

Applicants present evidence that the resulting properties, especially gloss of an ABS resin manufactured from a functionalized rubber is depending on a specific solution viscosity. There is no argument that the small rubber particles impart the gloss properties for the resulting product.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olga Asinovsky whose telephone number is 571-272-1066. The examiner can normally be reached on 9:00 to 5:30 pm.

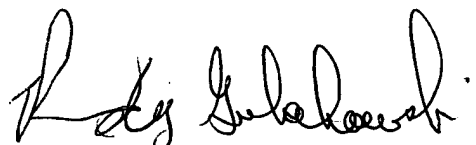
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:
10/543,121
Art Unit: 1796

Page 7

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

OA
January 21, 2008


RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
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